The VanLear Engine for Generating Engineering and Other Horizon Data for NASIS Population

Instructions for Beginners

Setup:

- Create a folder under the C: directory called: Engineering Program
  - C:\Engineering Program
  - Note that it must be the C-drive. The hyperlinks are written for the C-drive.
- Load the three files provided into this folder
  - engine.xls
  - enginedata.db
  - unified.xls

Start:

- It is easiest to just go through the Windows sequence of:
  1. Start
  2. Programs
  3. Windows NT Explorer (or similar)
  4. Open the “Engineering Program” folder.

- You are now in the folder with all the hyperlink files you need

1. To Generate Low and High Values From Scratch

STEP #	ACTION	COMMENTS
1	**OPEN engine.xls**	
2	**OPEN THE "start" SHEET**	Note the presence of the "help" sheet. This has further instructions. Note that within each sheet, there is a field with instructions also.
3	Click on "clear form" button	Clears data that may remain from a previous session
4	Fill in areas in yellow as needed with data available	Soil, map unit, and survey area will help keep track of this data later. Horizon layers and depths will help you keep track of your data. Enter all textures in your RIC. Make sure that low and high volumes (rock fragments) agree with your RIC and NASIS. Make sure that the value entered for fragments agrees with your TP and NASIS RV for volume. Make sure that bulk density low and high agrees with NASIS. Make sure you enter values for mineralogy and rock density.
5	Do a save when complete	
6	**OPEN SHEET "one"**	
7	Click on "Run"	This inserts sieve data (upper right)
8	Enter #4 sieve data in the yellow areas, reading from the graph	Round off numbers to nearest 5_ or _0
9	Do a save when complete	
10	**OPEN SHEET "two"**	
11	Click on "clear form" button	Clears data that may remain from a previous session
12	Complete either one of two rows in yellow for % clay low and high; (first row for entire range as shown above in the table; second row if you are going to limit the clay range for the project DMU component).	Make sure the range agrees with the range in NASIS.
13	Do a save when complete	
14	**OPEN SHEET "three"**	
15	Click on "Run"	This inserts the calculated LL, PI, #200, and #4 data for your reference
16	Print out the unified flowchart by clicking on the "unified flowchart" hyperlink (upper right) to assist you	
17	Click on the button "one" at top	Buttons 1-8 will generate the bar graph and unified chart for each horizon you have entered.

1. To Generate Low and High Values From Scratch (continued)

STEP #	ACTION	COMMENTS
18	Read the unified chart and enter unified textures in the yellow area for that horizon	Refer to the flowchart if #4 and/or #200 sieves crosses critical thresholds. Best to enter from flowchart if, for example, your range for #200 is both below and above 50%
19	Click on subsequent buttons “two”, “three”, etc until you have completed all horizons	
20	Do a save when complete	
21	**OPEN SHEET “four”**	
22	Click on “Run”	This inserts the LL, PI, #200, #40, and #10 data for your reference below left. Calculated AASHTO values are generated in the gray cells below center.
23	Click on the button “one” at top	
24	Verify the calculated AASHTO values on the chart for this horizon. Some may be very borderline and may not be wanted.	The chart is very confusing at first. Essentially, The color-coded horizontal lines represent critical breaks for that data element. If a low or high value (see the gray-black vertical bars) just creeps over a critical break, you can decide to keep or not to keep the AASHTO value that was calculated from there. Having the hardcopy of the MO14 Thunderbook chart for “Calculations of Highway Subgrade Materials with Suggested Subgroups” available may be helpful in the beginning.
25	Manually enter the AASHTO values in the yellow area for that horizon	The calculated values are probably pretty good.
26	Click on subsequent buttons “two”, “three”, etc until you have completed all horizons	
27	Do a save when complete	
28	**OPEN SHEET “print”**	
29	Do a normal “print” job of the form provided	Gives you a form with entered and generated data. Check this over to see what you have.
30	**OPEN SHEET “export”**	If you want to store this data for future reference in an electronic form, for review or editing purposes.
31	Click on the “copy” button lower left	
32	Click on the “engine data” button to the right of the “copy” button	This is a hyperlink to the file enginedata.db in Access.
33	In the **enginedata Access file**, click on the “Paste” button, upper left corner	(**Not** the “Nasis paste” button below it) Your data is now stored here.
34	Click on the “Data” button on the same row if you want to view the data in Access.	

2. To Generate RV Values for the Same Component

STEP #	ACTION	COMMENTS
1	**RETURN TO engine.xls**	
2	**OPEN THE "start" SHEET**	Change map unit symbol so that it is different (A-RV, E-RV, etc or SERIES NAME RVs, for examples). Edit this sheet so that only RV/TP values and textures remain. Keep only the TP texture for each horizon (it should agree with the RV "yes" texture in NASIS). Rock fragment volumes should be set to the RV for both low and high. Bulk density should be set to the RV in both low and high
3	Do a save when complete	
4	**OPEN SHEET "one"**	
7	Click on "Run"	This inserts sieve data (upper right), which should be the same value for both low and high
8	Enter #4 sieve data in the yellow areas, reading from the graph	Round off numbers to nearest 5_ or _0, which should be the same value for both low and high
9	Do a save when complete	
10	**OPEN SHEET "two"**	
11	Click on "clear form" button	Clears data that may remain from the previous session
12	Complete the second row in yellow for each horizon	Add the clay % RV, which should be same value for both low and high, and should agree with the RV value in NASIS for each horizon
13	Do a save when complete	
14	**COMPLETE STEPS #14-34 ABOVE IN: "1. To Generate Low and High Values From Scratch"**	Note 1: data for #40 and #200 sieves will still be generated as a range because it is reading from the chart which gives a range for each texture. Note 2: If more than one Unified or AASHTO classification is generated for a horizon, pick one and enter it in the yellow area for that horizon.

3. To Enter This Data into NASIS

STEP #	ACTION	COMMENTS
1	Go to the selected component in NASIS and have the 2 engine.xls printouts in hand	One printout for low and high, the second for RVs
2	Verify data entered into engine.xls	Make sure that data in the Horizon Table such as rock fragments low-RV-high, clay percent low-RV-high, bulk density low-RV-high, texture groups, textures marked as RV, are same as used in the engine.
3	Reading from the printouts, manually enter into the NASIS Horizon Tables for each horizon: Horizon-Horizon; #4, #10, #40, #200, LL, & PI columns Horizon-Horizon AASHTO Horizon-Horizon Unified	Enter low, RV, and high values using the 2 printouts. Note 1: Round off numbers to nearest 5_ or _0 for the #4, #10, #40, ands #200 sieve low and high values Note 2: Since the #40 and #200 sieve RV values were generated as a range, you will need to pick a midpoint for a value to enter, rounded to the nearest 5_ or _0, if possible Note 3: Enter all AASHTO and Unified entries, marking the RV appropriately for each horizon
4	Run NASIS Calculations	
5	Run NASIS Validations	

4. To Generate Low and High Values from Imported NASIS Data

STEP #	ACTION	COMMENTS
1	**IN NASIS**, do a query to load the selected component. You will need a query that will load Area Type, Area, Legend, and component	It may be best to do one component at a time, though more than one can be imported
2	Edit the horizon data that will be imported by the Standard Report queries: • Clay % low-RV-high to agree with your RIC and Typical Pedon • Texture groups and Texture RV to agree with your RIC and Typical Pedon • Rock fragment entries to agree with your RIC and Typical Pedon • Verify bulk density entries	Edit the Horizon-Horizon Fragment table for volume to agree with your RIC for low and high, and what is given in each horizon in the TP for an RV for each size fraction Note 1: The export is currently bringing the following: Soilseries, mapunit, surveyarea, horizon designation, horizon depths, clay, 3-10, >10, #4, #10, and bulk density
3	Save your data	
4	**GO TO:** • **"STANDARD REPORTS"** • **"LOCAL"**	
5	We will use 2 reports: 1. VA-Download data for VanLear Program (rv's) 2. VA-Download data for VanLear Program (high-low)	Save each one to a unique file name
6	**Go to:** **1. "NASIS Secure Access"** **2. Click on "NASIS Download"** **3. Click on "Reports"** **4. Enter your password** **5. Click on your state (va, etc)** **6. Click on both of your files** **7. Click on "Download File(s)** **8. Enter your password**	Send them to your "Designated Download Directory". Do not need to change the path. (Well, you can if you want, because we are going to have to change file names later anyway and does not really matter where we do it). If you want, you could change and save to: • C:\Engineering Program
7	In your designated folder, open your file with the low-high data	
8	Rename the file "**nasis.txt**"	The hyperlink into the Access program looks for this file name.
9	Save into the "C:\Engineering Program" folder, if not already there	Must have this file in the same folder as the enginedata Access file
10	**Open the enginedata Access file**	
11	Click on the "Import NASIS Data" button	

4. To Generate Low and High Values from Imported NASIS Data (continued)

STEP #	ACTION	COMMENTS
12	Click on “NASIS Paste” button	Can look at the data by clicking on the “NASIS Data” button. Can also rid the database of blank records by clicking on the “delete blank records (NASIS)” button. This is because 8 horizons will be loaded no matter how many horizons you have. **The engine will also only accept 8 horizons**.
13	Click on “NASIS Query” button • “yes” to run this type of query • “yes” to continue • type in the soil name; click “okay” • type in the map unit symbol; click “okay” • “yes” to pasting __ rows into a new table	The pasting action should export the data into the engine.xls file. Note1: if you get an encrypting message that stops you from proceeding, it may be that you are working on a second or more set of data and that the clipboard may be too full. Exit the Access file and open it again, and start again at the beginning of step 13.
14	**Open the engine.xls file**	You can view the data by opening the sheet **“import”**. This is not a necessary operation.
15	**OPEN THE “start” SHEET**	
16	Click on the “Reload Data” button, upper left	This loads the new data into this sheet
17	Verify the data	
18	**COMPLETE STEPS #5-34 ABOVE IN:** **“1. To Generate Low and High Values From Scratch”**	Remember, this is generating your low and high values

5. To Generate RV Values for the Same Component from Imported NASIS Data

STEP #	ACTION	COMMENTS
1	In your designated folder, open your file with the RV data	
2	**Option**: Edit the soilseries or mapunit to keep your RV data separate from your low-high.	Do something like soilseries-RV or A-rv, E-rv, etc on each row of data to help you keep them separate from the high-.low
3	Rename the file "**nasis.txt**"	
4	Save into the "C:\Engineering Program" folder, if not already there	Overwrite the previous file of the same name. You will overwrite everytime because the hyperlink into the Access program looks for this file name. Again, must have this file in the same folder as the enginedata Access file
5	**Open the enginedata Access file**	
6	Click on the "Import NASIS Data" button	
7	Click on "NASIS Paste" button	Can look at the data by clicking on the "NASIS Data" button. Can also rid the database of blank records by clicking on the "delete blank records (NASIS)" button. This is because 8 horizons will be loaded no matter how many horizons you have. **The engine will also only accept 8 horizons**.
8	**Option**: Edit the soilseries or mapunit to keep your RV data separate from your low-high.	Do something like soilseries-RV or A-rv, E-rv, etc on each row of data to help you keep them separate from the high-.low. **You should do one or the other of the renaming options, either step 2 or 8.**
9	Click on "NASIS Query" button • "yes" to run this type of query • "yes" to continue • type in the soil name; click "okay" • type in the map unit symbol; click "okay" • "yes" to pasting __ rows into a new table	The pasting action should export the data into the engine.xls file. Note1: if you get an encrypting message that stops you from proceeding, it may be that you are working on a second or more set of data and that the clipboard may be too full. Exit the Access file and open it again, and start again at the beginning of step 13.
10	**Open the engine.xls file**	You can view the data by opening the sheet **"import"**. This is not a necessary operation.
11	**OPEN THE "start" SHEET**	
12	Click on the "Reload Data" button, upper left	This loads the new data into this sheet from the import sheet
13	Verify the data	You may need to do some editing. All textures may come across. If so, eliminate all but the RV texture for each horizon.

5. To Generate RV Values for the Same Component from Imported NASIS Data (continued)

STEP #	ACTION	COMMENTS
14	**COMPLETE STEPS #5-34 ABOVE IN:** **"1. To Generate Low and High Values From Scratch"**	Remember that this is generating your RV values.
To Enter This Data into NASIS (Low-RV-High)		
15	Complete steps 1-5 as provided previously in the instructions: **"3. TO ENTER THIS DATA INTO NASIS"**	You should not have to verify the data that was exported form NASIS in the Downloads.

6. To Edit Saved Engine Data Stored in Access

STEP #	ACTION	COMMENTS
1	**Open the enginedata Access file**	
2	Click on "Query" button • "yes" to run this type of query • "yes" to continue • type in the soil name; click "okay" • type in the map unit symbol; click "okay" • "yes" to pasting __ rows into a new table	The pasting action should export the data into the engine.xls file. Note1: if you get an encrypting message that stops you from proceeding, it may be that you are working on a second or more set of data and that the clipboard may be too full. Exit the Access file and open it again, and start again at the beginning of step 2.
3	**Open the engine.xls file**	You can view the data by opening the sheet **"import"**. This is not a necessary operation.
4	**OPEN THE "start" SHEET**	
5	Click on the "Reload Data" button, upper left	This loads the new data into this sheet from the import sheet
6	**COMPLETE STEPS #5-34 ABOVE IN:** **"1. To Generate Low and High Values From Scratch"**	Note 1: Remember that the data you selected will be either a "low-high " component or an "RV" component. Note 2: You will need to run the RV data again if you change Typical Pedons, for example.
To Enter This Data into NASIS (Low-RV-High)		
7	Complete steps 1-5 as provided previously in the instructions: **"3. TO ENTER THIS DATA INTO NASIS"**	You should not have to verify the data that was exported form NASIS in the Downloads.